

# **Loudoun County Fire & Rescue**

**Training Division – EMS Training Section**



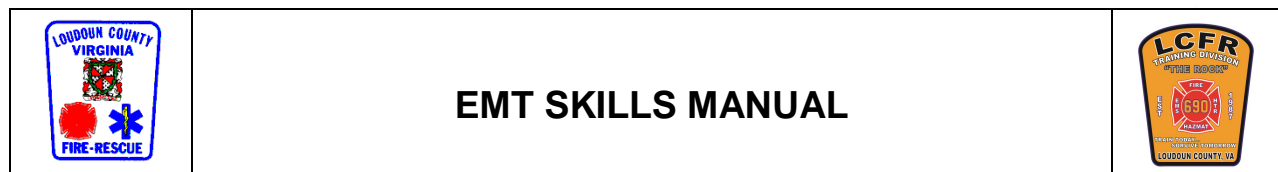
## **Basic Life Support Skills and Procedures Manual for EMS Classes**

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Throughout the EMT course, the students will be taught information and skills by various instructors. It is essential that students be taught this information in a consistent manner. This manual should be referred to when instructing students. With previous EMT classes, a continuous complaint issued by the students is that one instructor will tell the student how to accomplish a task and the next time that student attempts that task with a different instructor, that instructor states that they are doing it the wrong way.

While a student is taking the EMT course, teach according to this manual. This includes any practice outside of class. Often students will practice at a station and look for help from anyone that is available. While almost everyone who offers help has good intentions, this has caused a lot of confusion in the past. Do not teach the students the “station’s way” of accomplishing a task. Often times, students have been taught a certain way at a station and come testing day, students have failed for not meeting all the testing requirements. Teach according to the manual to ensure that the student will meet all the requirements when it comes to testing. This should not discourage students/crew members from practicing at the station. In fact, it is encouraged. Students need all the practice time they can get.

**THIS DOCUMENT IS A LIVING DOCUMENT – SUBJECT TO CHANGE!!**



## EMT PATIENT INTERVENTION PROCEDURES



This portion of the manual refers to the specific instructions for application/description of certain devices used as patient interventions. Step-by-step instructions are given along with picture descriptions. Refer to these procedures when instructing the students so that they are taught in a consistent manner.

### OPA Sizing and Insertion

- ❖ An OPA is measured from the corner of the mouth to the angle of the jaw
- ❖ It is inserted upside down until it reaches the soft palate, then rotated 180 degrees and inserted until the top is resting flush with the lips



### NPA Sizing and Insertion

- ❖ A NPA is measured from the tip of the nose to the angle of the jaw
- ❖ It is also necessary to consider the diameter of the nostril when inserting these adjuncts
- ❖ A NPA is lubricated with a water-soluble lubricant
- ❖ Inserted following the pathway of the nasal anatomy, utilizing the visually larger of the two nostrils (No longer inserted bevel towards the septum)
- ❖ If resistance is met in one nostril, gently twirl the NPA in an attempt to pass the obstruction. If resistance is still met, remove and attempt other nostril.
- ❖ Insert until NPA flange is flush with the nostril



### Non-Rebreather (NRB) Application

- ❖ Select appropriate size (adult, pediatric, or infant)
- ❖ Connect to oxygen source and run at 10-15 lpm.
- ❖ Place finger over white plastic valve to inflate reservoir bag
- ❖ Place top of the mask over the bridge of nose and rest against face
- ❖ Pull and secure elastic strap around the head, resting above the ears
- ❖ Oxygen must be flowing prior to placing NRB on patient



### **Nasal Cannula (NC) Application**

- ❖ Select appropriate size (adult, pediatric, or infant)
- ❖ Connect to oxygen source and run at 2-6 lpm
- ❖ Insert nasal prongs into both nares, following curvature of anatomy
- ❖ Have tubing curve around ears and set slide adjuster to ensure NC is not loose



### **Venturi Mask Application**

- ❖ Low flow oxygen system that provides precise concentration of oxygen through a valve connected to the face mask
- ❖ Commonly used for chronic management for patients with COPD



### **Simple Face Mask Application**

- ❖ Delivers up to 60% oxygen
- ❖ Oxygen flow rate usually 10 lpm, but not less than 6 lpm



### **Bulb Suction**

- ❖ Primarily used on infants or newborns during delivery
- ❖ Can be inserted into mouth or nose to clear secretions
- ❖ Bulb must be depressed prior to inserting
- ❖ Insert depressed bulb into mouth/nose
- ❖ Release bulb, which will create a vacuum/suction effect
- ❖ Repeat if needed



### **Hard-Tip Suction (Yankauer)**

- ❖ Measured from the corner of the mouth to the corner of the jaw
- ❖ Marked either with a finger or visually as to the limit of depth during insertion
- ❖ The catheter is then inserted orally to the base of the tongue (utilizing the predetermined mark)
- ❖ Hole is occluded to provide suction
- ❖ Airway is suctioned on the way out for no more than 15 seconds
- ❖ If repeat suctioning is necessary, the patient should be oxygenated adequately between suctionings.
- ❖ It may be necessary to suction sterile water inbetween to clear the suction catheter and tubing



### Soft-Tip Suction (French catheter)

- ❖ Measured from the corner of the mouth to the corner of the jaw
- ❖ Marked either with a finger or visually as to the limit of depth during insertion
- ❖ The catheter is then inserted orally to the base of the tongue (utilizing the predetermined mark)
- ❖ Hole is occluded to provide suction
- ❖ Airway is suctioned on the way out
- ❖ If repeat suctioning is necessary, the patient should be oxygenated adequately between suctionings.
- ❖ It may be necessary to suction sterile water in-between to clear the suction catheter and tubing



### Oxygen Tank Assembly

- ❖ Inspect the oxygen cylinder for damage
- ❖ Briefly crack open the neck of the cylinder to blow any debris from the oxygen flow holes.
- ❖ Make sure an “O” ring is attached to the oxygen cylinder or the regulator. Models vary. Only one “O” ring is required.
- ❖ Attach the regulator, assuring there are no leaks when complete.
- ❖



- ❖ Open the cylinder all the way (clockwise = off, counter-clockwise = on)
- ❖ Attach proper delivery device to regulator
- ❖ Adjust flow to the appropriate liters per minute for the selected device

### 1-Person Ventilations

- ❖ Provider must ensure that the patient's airway has been opened using an appropriate method (head-tilt chin-lift, or jaw thrust) prior to providing ventilations.

- ❖ Face mask placed on patient
  - ◇ The top of the face mask should be positioned across the bridge of the nose
- ❖ Provider will hold face mask to the patient's face using the "C-E" technique with one hand while holding up the jaw to keep the airway open
- ❖ The provider's other hand will hold and squeeze the BVM to provide ventilations
- ❖ The provider must ensure that the chest rises and air does not leak from around the face mask



## 2-Person Ventilations

- ❖ Providers must ensure that the patient's airway has been opened using an appropriate method (head-tilt chin-lift, or jaw thrust) prior to providing ventilations.
- ❖ Face mask placed on patient
  - ◇ The top of the face mask should be positioned across the bridge of the nose
- ❖ One provider is responsible for holding the face mask to the patient's face
  - ◇ The provider will be located at the top of the head and use both hands to hold face mask
  - ◇ One hand will be placed on each side of the mask, with thumb and pointer finger holding the face mask in place while other fingers are placed along the jaw bone holding up the airway
- ❖ The second provider is responsible for providing ventilations with BVM
- ❖ Providers must ensure that the chest rises and air does not leak from around the face mask







## PATIENT ASSESSMENT



Throughout the EMT course, the students will be taught information and skills by various instructors. It is essential that students be taught this information in a consistent manner. This manual should be referred to when instructing students. With previous EMT classes, a continuous complaint issued by the students is that one instructor will tell the student how to accomplish a task and the next time that student attempts that task with a different instructor, that instructor states that they are doing it the wrong way.

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In this chapter, you will find information regarding what is expected during a medical and trauma scenario. This includes all required steps through the patient assessment.

## I: Medical Evaluation

**Medical scenarios may or may not require administration of a medication.** If medication is required, students **MUST** call medical control prior to administration of each medication dose.

Throughout the class and during county testing, students will be doing scenarios in pairs. One will be the lead and their partner will assist. The lead is the one being evaluated. The lead will run the call and make patient care decisions. The assist plays the role of the helper. They will be the one obtaining vital signs and doing what the lead instructs them to do. **The lead and assist should communicate with each other. They can help each other out and offer suggestions.** The assist should use caution to ensure that they don't take over and start running the scenario. It is up to the lead to not let that happen.

Throughout class practical sessions, evaluators and students will be referencing the LCFR medical practical evaluation sheet as a learning tool. This sheet is not the testing evaluation sheet. This sheet is designed in outline format and each section highlights what is required of the student for the various components of the patient assessment.

When evaluating the students, they have to meet certain requirements in order to complete a scenario correctly. Below are the actions that the students should be performing for each scenario.

### ➤ Scene Size-Up

- Scene safety must be assessed. Make sure students are actually asking if the scene is safe and that they don't just walk into a scenario. Sometimes the scene is not safe and if this is the case, students are not permitted to enter the scene until it is safe to do so. If they do enter a scene when it is not safe, they fail.
- BSI needs to be taken. Students are required to either wear gloves or verbalize wearing gloves. Either one is fine for class practical sessions and testing.
- Identify the number of patients
- Request additional resources, for most medical scenarios ALS is required as an additional resource
- NOI (nature of illness) should be verbalized.

### ➤ Primary Assessment

- Verbalize a general impression of the patient.
- Determine mental status/level of responsiveness
- Airway assessed. Students will need to determine if the airway is compromised or not. Certain medical conditions (such as a diabetic or overdose) can have a patient that is drooling or having a hard time swallowing. If any kind of drooling or secretions are noted to the airway, then the airway will need to be suctioned.
- **ALL PATIENTS RECEIVE OXYGEN according to their physiologic needs delivered at a flow rate appropriate for the delivery device chosen.**
- Breathing evaluated. If breathing is found to be inadequate, ventilations must be performed.
- Circulation evaluated. There are three components when checking circulation:

- ❖ Pulse: Check a radial and carotid at the same time. Both of these should be done on the same side of the body. When checking the initial pulse, it is only necessary to check for 5-10 seconds.
- ❖ Skin: Assess color, temperature, and condition
- ❖ Blood sweep: May be verbalized during a medical scenario. All the students are required to say is that they will be assessing for any major bleeding.
- Patient priority determined. The student need not verbalize whether the patient is load-and-go or stay-and-play. They should be evaluated based on what they do.

### ➤ Secondary Assessment

- Determine patient's name and age
- Determine chief complaint
- Assess history and presentation of present illness
  - ❖ SAMPLE
  - ❖ OPQRST
- Obtains baseline vital signs
  - ❖ The baseline set is done by the assist while the lead is trying to gather information from the patient
  - ❖ Pulse, blood pressure, pupils, lung sounds, respirations, and skin conditions are required for a full set of vital signs
  - ❖ When stating vital signs to the evaluator, make sure the students are not just giving a number. The students need to be describing the vital signs that they have obtained.
    - ◇ Example: Pulse is 98, irregular, rapid, and weak
- If medication is required for scenario
  - ❖ The lead will be the one administering the medication
  - ❖ Ask patient if they have taken any previous doses prior to EMS arrival
    - ◇ If a patient has taken any doses prior to EMS arrival, these doses count as part of the total doses that an EMT may give for a certain medication
  - ❖ Ensure that the patient meets the required indications for that medication
  - ❖ Ensure that the patient does not meet any contraindications for that medication
  - ❖ Verify that the medication meets the five rights prior to administration
    - ◇ Right drug, dose, date, route, and patient
    - ◇ The medications used throughout class will be expired according to the marking on the actual medication. The training center stocks expired medication for training. As an evaluator, you will advise the students of the correct expiration date for that scenario.
  - ❖ **STUDENTS MUST CONTACT MEDICAL CONTROL PRIOR TO EACH DOSE OF MEDICATION ADMINISERED**
  - ❖ Appropriately administers medication
- Patient transport guidelines:
  - ❖ If no medication is required for the scenario, students can transport at any time after they have completed an assessment
  - ❖ If medication is required for the scenario, students must administer the medication on scene

- ◇ If a single dose of medication is required (glucose, activated charcoal, and Epi-Pen) the medication must be administered on scene and then the patient can be transferred into the ambulance and transported
- ◇ If multiple doses of a medication are required (inhaler or Nitro), the first dose of the medication must be administered on scene and then the patient can be transferred into the ambulance and transported. Any additional doses of that medication can be administered in the back of the ambulance.

➤ **Repeat Primary and Secondary Assessment**

- Reassess level of consciousness, airway, breathing, and circulation
- Repeat set of vital signs
  - ❖ The assist will be obtaining these vital signs. If the lead has completed their tasks, then the lead can help the assist in getting the complete set.
  - ❖ **A FULL SET OF VITAL SIGNS IS REQUIRED AFTER EVERY MEDICATION DOSE**
    - ◇ This means that a set of vital signs could be obtained up to four times in one scenario
- Lead administers any additional doses of medication if required
  - ❖ For a trouble breathing/chest pain scenario, multiple doses of medication could be required. As long as the patient is having signs and symptoms of a medical emergency and has not met the maximum doses for that specific medication or contraindications, then medication should be administered until the patient is symptom-free.
  - ❖ Remember they must contact medical control prior to every medication dose and obtain a full set of vitals after every dose.
- Verbalize on-going assessment plan
- Verbalize being at the hospital/or that the scenario is complete. **RECORD THIS AS THE SCENARIO COMPLETION TIME.**

## II: Trauma Evaluation

Throughout the class and during county testing, students will be doing scenarios in pairs. One will be the lead and their partner will assist. The lead is the one being evaluated. The lead will run the call and make patient care decisions. The assist plays the role of the helper. They will be the one obtaining vital signs and doing what the lead instructs them to do. **The lead and assist should communicate with each other. They can help each other out and offer suggestions.** The assist should use caution to ensure that they don't take over and start running the scenario. It is up to the lead to not let that happen.

Throughout class, the evaluators will be using the LCFR trauma practical evaluation sheet as a teaching tool. This is not the testing evaluation sheet. This sheet is designed in outline format and each section highlights what is required of the student for the various components of the patient assessment.

When evaluating the students, they have to meet certain requirements in order to complete a scenario correctly. Below are the actions that the students should be performing for each scenario.

### ➤ Scene Size-Up

- Scene safety assessed. Make sure students are actually asking if the scene is safe and that they don't just walk into a scenario. Sometimes the scene is not safe and if this is the case, students are not permitted to enter the scene until it is safe to do so. If they do enter when it is not safe, they fail.
- BSI needs to be taken. Students are required to either wear gloves or verbalize wearing gloves. Either one is fine for class practical sessions and testing.
- Identify number of patients
- Request additional resources. These can include ALS, PD, helicopter, utilities, animal control, etc. Students only need to request what is needed for that scenario.
- MOI noted

### ➤ Primary Assessment

- Verbalize a general impression of the patient
- Immediately manually take c-spine control. Once the student has demonstrated proper control of c-spine, c-spine can be handed off to an invisible EMT. The evaluator must acknowledge that the student will be handing off c-spine. If the student lets go of c-spine without the evaluator's consent, then that is considered loss of c-spine control and a critical failure.
- Determine level of consciousness. The patient will be alert, responsive to verbal, responsive to pain, or unresponsive (AVPU).
- Assess airway. Students will need to determine if the airway is open or not. If the airway is not open, then the airway needs to be opened with a jaw-thrust and an OPA/NPA needs to be inserted to maintain the airway. If the patient is found in the prone position, the patient needs to be rolled into the supine position (while maintaining c-spine control) to assess the airway before any other patient management is done.
  - ❖ If snoring respirations are noted, a jaw-thrust and OPA is required
  - ❖ If gurgling is noted, suction is required
- **ALL PATIENTS RECEIVE OXYGEN according to their physiologic needs delivered at a flow rate appropriate for the delivery device chosen.**

- Breathing evaluated. If breathing is found to be inadequate, ventilations must be given
- Circulation evaluated. There are three components when checking this.
  - ❖ Pulse: Check radial and carotid at the same time. Both of these should be done on the same side of the body. When checking this initial pulse, only required to check 5-10 seconds.
  - ❖ Skin: Assess color, temperature, and condition
  - ❖ Blood Sweep: A head to toe sweep to look for any major bleeding. If any moderate or major bleeding is found, students need to treat that bleeding when found. There should be no delay in treating life-threatening bleeding.
- Patient priority determined. **Load and go or stay and play.**
- Expose patient. This will be verbalized or if the patient is wearing moulage clothes, shirt and pants must be lifted appropriately to expose patient and assess for injuries.

### ➤ Secondary Assessment

- DCAP-BTLS checked for on each major body region listed below. Additional items that should be considered for each region are as follows:
  - ❖ Head: Check for fluid from ears/nose/mouth, battle signs, and raccoon eyes
  - ❖ Neck: Check for step off, JVD, tracheal deviation and any medical alert jewelry. Once the neck has been palpated and no deformity noted (neck “cleared”), c-collar can be applied.
  - ❖ Chest: Check for equal chest rise and listen to lung sounds. When listening to lung sounds, this is a quick listen to see if lung sounds are absent/present.
  - ❖ Abdomen: Abdomen palpated in four quadrants. Look for tenderness, grimace, or rigidity.
  - ❖ Pelvis: Push down and in on pelvis to determine if any crepitus is noted
  - ❖ Legs: CMS checked in both extremities at the same time
  - ❖ Arms: CMS checked in both extremities at the same time
- Log roll patient onto their side facing students (while maintaining c-spine control)
  - ❖ Back: Check back and posterior side of patient.
- Log roll patient onto backboard
- The patient may need to be adjusted. Body should be in a straight line, head cannot extend over the backboard, feet can extend over the backboard ONLY if the patient is tall. When adjusting a patient, it should be done in a “zig-zag” fashion while maintaining c-spine control. Further details on these procedures can be found in the EMT Immobilization Procedures section of this manual under ‘Backboarding’.
- **IF AT ANY POINT DURING THE SECONDARY ASSESSMENT THE STUDENTS COME ACROSS A LIFE-THREATENING INJURY, THE STUDENTS MUST TREAT THAT LIFE-THREATENING INJURY IMMEDIATELY WHEN FOUND.** Neck laceration, flail chest, sucking chest wound, major/severe bleeding, and evisceration are considered life-threatening injuries.
- The patient should now be secured to the backboard. The technique used for this procedure can be found detailed in the EMT Immobilization Procedures section of this manual.
- Once patient fully immobilized to the backboard, CMS rechecked in all four extremities before patient movement.
- **AT THIS POINT, ONCE THE PATIENT IS FULLY IMMOBILIZED TO THE BACKBOARD AND CMS HAS BEEN CHECKED, STUDENTS VERBALIZE THAT THEY ARE NOW TRANSPORTING OR IN THE BACK OF THE**

AMBULANCE. NOTE THIS TIME AS THEIR TRANSPORT TIME AND RECORD ON EVALUATION SHEET.

➤ **Repeat Primary and Secondary Assessments**

- Reassess level of consciousness, airway, breathing, and circulation
- Initial set of vital signs obtained. The assist will obtain this initial set.
  - ❖ Lung sounds, pulse, respirations, skin, pupils, and blood pressure
  - ❖ If signs and symptoms indicate shock, treat accordingly.
- While the assist obtains the vital signs, the lead performs the repeated primary and secondary exams. The exams are done in the same fashion.
- Check patient treatment interventions: May need to apply additional treatments
- Treat any non life-threatening injuries: All injuries must be treated in some fashion before the lead states that they have finished.
- Repeat set of vital signs. The assist should be taking these, but the lead can help to obtain the full set of vital signs.
  - ❖ Vital signs are taken every 5 minutes for a load and go
  - ❖ Vital signs are taken every 15 minutes for a stay and play
- Obtain patient history if able to. This information can be obtained from the patient, bystanders, family, caretakers, etc. Students need to make sure they ask for bystanders, especially if the patient has a decreased mental status and cannot provide information themselves.
- Verbalize on-going assessment plan
- Students verbalize being at the hospital/or that the scenario is complete. **RECORD THIS AS THE SCENARIO COMPLETION TIME**



## PATIENT ASSESSMENT

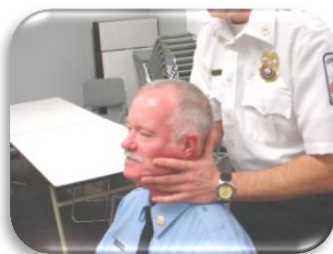


This portion of the manual refers to the specific instructions for various immobilization/splinting procedures that an EMT will have to perform in the field. Step-by-step instructions are given along with picture descriptions. Refer to these procedures when instructing the students so that they are taught in a consistent manner.

### Manual Stabilization of C-Spine

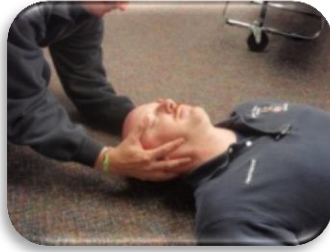
#### ❖ Standing or Sitting Patient

- ◇ While behind the patient, hands should be placed on the side of the face/neck
- ◇ Thumbs should be extended to provide support to the back of the head
- ◇ Fingers should be spread out to cover a greater surface area. Avoid placing pressure on the soft tissues of the neck. Fingers should be placed over the bony areas (jaw or skull)
- ◇ When applying a c-collar, fingers are lifted up while maintaining stabilization
- ◇ Once a c-collar is in place, the EMT's hands should be returned to the original position over the c-collar



#### ❖ Supine Patient

- ◇ While kneeling or lying behind the patient, hands should be placed on the side of the face/neck
- ◇ Thumbs should be extended to provide support to the side of the head
- ◇ Fingers should be spread out to cover a greater surface area. Avoid placing pressure on the soft tissues of the neck. Fingers should be placed over the bony areas (jaw or skull)
- ◇ Once a c-collar is in place, the EMT's hands should be returned to the original position over the c-collar



### C-Collar Sizing

- ❖ While looking at the patient, an imaginary line should be drawn across the top of the shoulders and another across the bottom of the chin
- ❖ Measure the space/distance between the two imaginary lines using your fingers. Note how many fingers wide this space is.
- ❖ Select a collar. The distance between the sizing post (black fastener) and the lower edge of the rigid plastic should match the distance of the finger widths previously measured. If not, select another size of collar until a size matches. Be aware that different manufacturers may use different measuring points.



- ❖ Note that some patients anatomically will not fit into a c-collar. In this situation towels or a blanket roll may be used.



### C-Collar Application

- ❖ After selecting the appropriate sized collar, slide the c-collar up the chest wall into place. The chin should rest on the chin piece. The chin must not be able to retract into the chin piece (this may cause airway issues if not fixed).
- ❖ Pull the remainder of the collar around the neck and secure the Velcro. Once the Velcro has been fastened, the collar should be snug around the neck. If properly applied, the patient will not be able to move head forward and backward and/or left and right.

- ❖ Recheck the position of the head. Head should still be in the neutral position and aligned straight. If not, adjust or select a different size c-collar.



### **Backboarding**

- ❖ One student maintains manual c-spine control
  - ◇ Manual c-spine control CANNOT be released until the patient is fully immobilized
- ❖ A minimum of two, preferably three, providers will kneel down at the side of the patient in a row to perform a 'logroll'.
- ❖ The providers on the side will reach across and take hold of the patient (providers arms on the inside will cross over to allow greater stabilization of the patient)
- ❖ The patient is rolled onto their side, toward the providers. Provider at the head must keep control of the head and roll it in time with the body. The timing of the log roll should be controlled by the person holding the head.
- ❖ The backboard is placed against the patient and the patient then rolled back into their original position, now supine on top of the backboard.



- ❖ The patient should be positioned centrally on the backboard with neither their head nor feet hanging over the ends of the board.

- ❖ If the patient needs to be repositioned this can be done in a zig-zag motion
  - ◇ When adjusting a patient, one provider will take hold of the patient at the shoulders. The other provider will take hold of the pelvis. Working together, the two providers will adjust the patient up or down as needed. Providers need to hold the patient by their body parts, not grab the patient by their clothes.
  - ◇ The patient should **NEVER** be pushed from the side, as this compromises c-spine control.



- ❖ The patient is then fully immobilized to the backboard using an appropriate method of strapping down the patient (i.e. spider straps).
- CARE SHOULD BE TAKEN TO PAD ALL VOID SPACES AND PRESSURE POINTS BETWEEN THE PATIENT AND THE BACKBOARD. AS NECESSARY, PADDING CAN BE PLACED UNDER HEAD AND/OR SHOULDERS TO MAINTAIN NEUTRAL POSITION!!

Padding under head may be necessary to maintain in-line positioning.

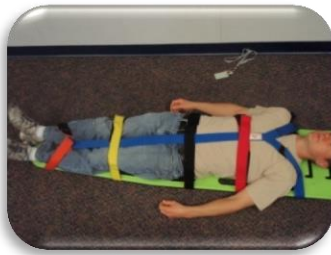


### Spider-Strap Application

- ❖ Spider-straps are the most commonly used backboard straps in Loudoun County. Alternatives may be used such as seatbelt straps, cravats, etc.

Spider straps are detailed here due to their popularity and ease of application.

- ❖ The shoulder straps are secured first. Straps should be flush with the shoulder to allow proper placement of head blocks. Caution should be used that the straps are not impinging on the patient's neck area.
- ❖ The feet straps are secured next
  - ◇ Should be placed so that the center strap extending from the head to feet is snug against the body and midline.
- ❖ There is no specific order for applying the three remaining straps, however they need to be in the proper place.
  - ◇ One strap will need to be over the pelvis (the bony part)
  - ◇ One strap will need to be over the chest (ribs), as close to the armpits as is comfortable for the patient.
  - ◇ One strap will need to be over the lower thigh
- ❖ Straps cannot be placed over the kneecap or over the abdominal region. Straps need to be placed over hard bony surface areas on the body.



### Head Immobilization

- ❖ C-spine should already be manually maintained and c-collar already applied to the patient.
- ❖ Head blocks are placed on the left and right side of the head. As a head block is being placed on each side of the head, the provider manually maintaining c-spine will place their hand over the head block continuing to manually maintain c-spine with head blocks in place
- ❖ Tape is used to secure head blocks. Tape should be placed across the forehead and across the chin. Each piece will extend from one side of the backboard to the opposite side
- ❖ Provider can release manual c-spine once the head blocks and tape have been secured



**The Proper Way to REMOVE TAPE is to tear the tape at the mid-line and then peel away the tape to either side away from the mid-line on the head.**



### **Standing Takedown**

- ❖ One provider will stand behind the patient and manually control c-spine (does not let go until patient is fully immobilized)
- ❖ A backboard is placed between the patient and the provider holding c-spine



- ❖ A provider will stand one on each side of the patient. One hand should hold the patient underneath the armpit and the other hand will steady the backboard.
- ❖ The patient and backboard are lowered in a backwards motion, working together as a team.
- ❖ Communication with the patient is vital.
- ❖ Once the patient and backboard are lying on the ground, full immobilization should be completed as described elsewhere in this guide.



(Note: in these photos, FF Fred is controlling c-spine)

## KED Application

- ❖ Take and maintain manual cervical support
  - ◇ Manual cervical support **must be** maintained by the assistant until patient is fully immobilized in KED, by the lead.
- ❖ Perform CMS in all 4 extremities
  - ◇ Upper extremities at the same time and lower extremities at the same time
- ❖ Measure and apply appropriate c-collar
  - ◇ Once c-collar is in place, have the patient place their hands on the “steering wheel”



- ❖ At this point, the patient will most likely not be sitting up in a straight/upright position
- ❖ One way to accomplish this is to stand to the side of the patient. With the one hand, place the palm against the patient's back. With the other arm, have it come across the patient's chest and grab the front of the c-collar. While supporting the back, take the arm/hand in the front and gently pull the patient up in a straight position. Once the patient is in this straight position, it will allow for easier application of the KED
- ❖ Position KED device behind patient
  - ◇ KED should be centered and resting directly underneath the armpits
  - ◇ Once KED has been positioned behind patient, have patient remain in straight upright position. Do not have patient recline back in chair.
- ❖ Secure the 3 trunk straps (does not matter in what order)
  - ◇ Straps should be snug against the trunk, but not too snug to inhibit breathing
  - ◇ When securing the straps, caution should be used as to not jerk or make sudden movements that will cause excessive patient manipulation
- ❖ Secure the two leg/groin straps
  - ◇ Straps should rest in the crease between the thigh and hip. Straps should be snug. Padding can be applied.
  - ◇ When positioning straps, straps should be placed underneath the leg and pulled in a zig-zag fashion to their correct location
- ❖ Secure head

- ◇ If necessary, padding may be placed behind head. Patient should be properly aligned and straight before considering the use of padding.
- ◇ Head is secured with 2-3 inch tape. Tape will need to go across forehead and across the chin area (over the c-collar, not on the actual skin).
- ◇ It is a good idea to use one continuous piece of tape and have the tape overlap itself. When using two separate pieces of tape, the tape tends to not stick to the KED material



- ❖ Recheck CMS in all 4 extremities
- ❖ Patient lifted onto a backboard. This is a minimum of a 2-person job. A student will need to be on each side of the patient. One hand will grasp the handle attached to the KED and the other hand will go underneath the patient's legs. The hands underneath the patient's legs should be grasped together and held tight while lifting. The patient is then lifted and placed on the backboard.
- ❖ The leg straps are released and legs assisted to the straight position on the backboard



- ❖ Patient fully immobilized to the backboard (verbalized for testing and BLS skills)
- ❖ CMS rechecked in all 4 extremities

## Traction Splint Application

- ❖ Lead student manually stabilizes injured leg. One hand will need to be placed above the injured femur site and one hand below the injured femur site (but still above the knee).
- ❖ Assist student checks CMS in the lower extremities. Shoes MUST be removed and CMS checked in both extremities at the same time.
- ❖ Verbalize exposing the patient's leg
- ❖ The ankle hitch is applied around the ankle by the assist, taking care not to move the leg excessively
- ❖ Assist Student manually pulls traction on the injured leg. Person can either directly grasp the ankle with both hands or pull on the ankle hitch with one hand and have the other hand grasping the ankle. One hand should always be on the ankle in case of ankle hitch malfunction. Assist cannot release this traction at any time until traction splint is completed.



- ❖ Once manual traction is being pulled by the assist, the lead can now release their stabilization
- ❖ Lead adjusts and selects the proper length for the traction splint. This will be measured on the uninjured leg. The base of the splint should align with the ischial tuberosity and extend 6-12 inches past the foot.
- ❖ Once the length is set, it is placed underneath the injured leg. It needs to rest underneath the ischial tuberosity (wallet line). Leg cannot be grossly manipulated while trying to place traction splint underneath patient.
- ❖ Ischial strap secured to patient, resting in the groin area, **PADDING** between strap and leg.
- ❖ Ankle hitch now secured to the traction splint. The S hook will latch into the ankle strap clip. The wheel needs to be cranked until strap is snug or patient feels relief.



### **Manual traction can NOT yet be released**

- ❖ The velcro straps are now secured to the leg. It does not matter in what order, as long as they are in the correct position. Two straps are placed on the femur, one above the injury site and one below. Straps cannot be placed over the knee or directly over the injury site. Two straps are placed on the lower leg, between the knee and ankle.
- ❖ Recheck traction, may have to adjust tightness again
- ❖ Once this is verified, manual traction can be released
- ❖ CMS rechecked again by the assist in both lower extremities at the same time



### **Sling and Swathe Application**

- ❖ Check CMS in both upper extremities at the same time
- ❖ Cravat positioned across patient's chest. The point of the triangular bandage (cravat) will be towards the patient's elbow.
- ❖ A knot can be tied in this corner, allowing a pocket to "catch" the elbow.
- ❖ Form the sling by lifting the ends of cravat and cradling the arm
- ❖ The ends of the cravat are brought around the neck. The ends need to be pulled tight enough so that the arm cannot drop, and the patient feels that their arm is being supported. Once this is established, the ends are to be tied in a knot against the neck, with padding placed for comfort.
- ❖ A swathe is formed by folding a cravat so that it is about 2-3" wide
- ❖ The swathe is then placed across the arm in the sling, with the broad surface of swathe going around the injured arm's humerus. The two ends of the swathe should then be tied with padding underneath the knot. Neither the swathe nor the knot should be tied over an injured area.
- ❖ The swathe must encompass the forearm. It cannot be placed across the chest and only include the cravat.
- ❖ CMS rechecked in both upper extremities at the same time



### **Humerus Immobilization**

- ❖ Establish manual stabilization by holding shoulder and elbow joint
- ❖ CMS checked in both upper extremities at the same time
- ❖ A small padded board is placed against the humerus
- ❖ Secured with two cravats, one above and one below injury site
- ❖ Secured with sling and swathe (sling can be ½, or modified wrist)
- ❖ CMS rechecked in both upper extremities at the same time
- ❖ If found in strait arm position, follow same stabilization and CMS.
- ❖ Sandwich small board inside arm and longer board outside.
- ❖ Tie two boards together, then cravat at least three times, (top, middle, bottom) to patient
- ❖ Patient has to be lying down to cravat long board to body, will be unable to sit up after they are tied correctly.



### **Elbow Immobilization (A-frame)**

- ❖ Establish manual stabilization by holding bone above and below elbow
- ❖ A padded board is placed on one side of the elbow
- ❖ Another padded board is placed on the other side of the elbow. Person holding manual stabilization will continue to hold stabilization and boards in place until splinting is complete.

- ❖ One cravat will need to be tied in the crook of the elbow pulling the two padded boards together. This cravat is only secured around the boards in order to provide better stabilization. This may not always be possible depending on the size of the patient.
- ❖ Cravats need to be tied at the two locations where the boards intersect with the extremity. At each intersection, the cravat can be tied in an “X” fashion making sure to encompass the arm. Cravats should be tied snugly, but not so tight that circulation is impaired.
- ❖ Once the A-frame is secured to the elbow, a sling and swathe needs to be applied



#### **Radius/Ulna Immobilization (board splint)**

- ❖ Manual stabilization initially done by manually holding the area above and below the injury site (maintained until splinting is complete)
- ❖ CMS checked in both upper extremities at the same time
- ❖ A small padded board is used. The board placed underneath the forearm (padded side toward patients arm). The person holding manual stabilization is now also holding the board against the arm.
- ❖ Hand placed in position of function. Can be done by placing roller gauze underneath the fingers. The goal is to leave the hand/fingers in a curved position. Hand must be positioned on board, cannot hang over the edge of the board.



- ❖ Cravats tied to secure the padded board to the arm. One cravat above the injury site and one below. The wrist also will need to be secured to the board. An additional cravat can be used for this. If they choose, instead of using a third cravat, they can use the cravat from below the injury site. This cravat will need to be initially secured below the injury site, but it can wrap around, extend over the hand, come across the knuckles, and tie underneath.
- ❖ It is optional for the thumb to be included when securing the hand



- ❖ The cravats should not be placed directly over the injury site
- ❖ When tying a knot with the cravat, the knot cannot be tied over the skin. It needs to be tied over a void space or against the board.
- ❖ Another option is to use roller gauze instead of cravats. With this, students will just roll the gauze from the elbow down to the hand.
- ❖ Once the board is secured to the forearm, a sling and swathe needs to be applied
- ❖ Recheck CMS on both extremities once splinting is complete

### Wrist Immobilization

- ❖ Manual stabilization is initially done by manually holding the area above and below the wrist (maintained until splinting is complete)
- ❖ CMS checked in both upper extremities at the same time
- ❖ A small padded board is used. The board placed underneath the forearm (padded side toward patients arm). The person holding manual stabilization is now also holding the board against the arm.
- ❖ Hand placed in position of function. Can be accomplished by placing roll gauze underneath the fingers. The goal is to leave the hand/fingers in a curved position. Hand must be positioned on board, cannot hang over the edge of the board.



- ❖ Cravats tied to secure the padded board to the arm. Two cravats are used to secure the forearm to the board. The hand also is secured to the board. An additional cravat can be used for this. If they choose, instead of using a third cravat, they can use the cravat closest to the wrist that is secured to the forearm. This cravat will need to be initially secured close to the wrist, but it can wrap around and extend over the hand and come across the knuckles and tie underneath.
- ❖ It is optional for the thumb to be included when securing the hand
- ❖ The cravats are not be placed over the wrist
- ❖ When tying a knot with the cravat, the knot cannot be tied over the skin. It needs to be tied over a void space or against the board.
- ❖ Another option is to use roller gauze instead of cravats. With this, students will just roll the gauze from distal to proximal on extremity.
- ❖ Recheck CMS on both extremities once splinting is complete

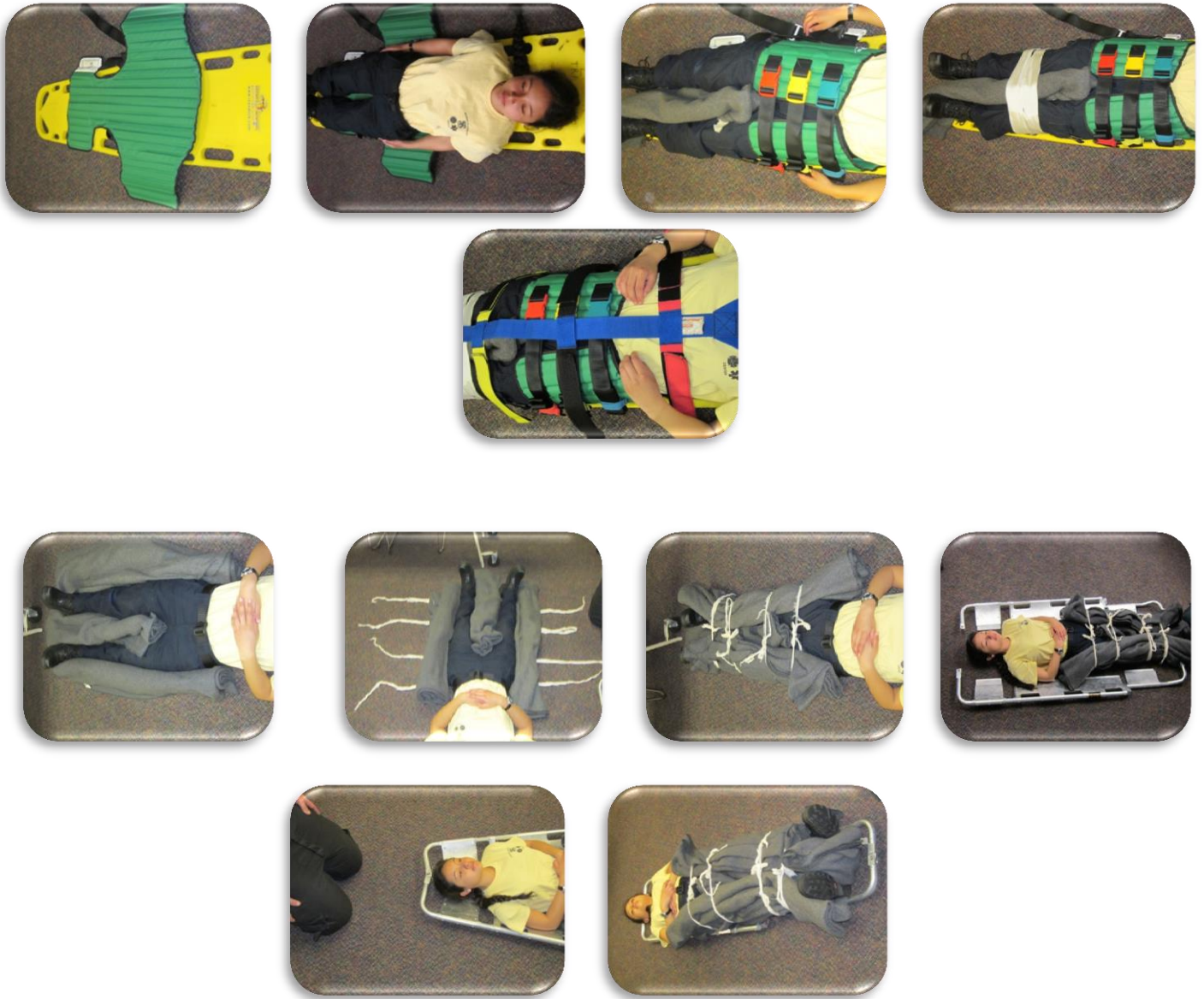
- ❖ A sling and swathe is not required due to hand and forearm being immobilized, which meets the requirements of securing the bone above and below an injured joint



### **Hip/Pelvis Immobilization**

- ❖ Patient will need to be gently log rolled onto backboard with minimal movement
- ❖ Padding will need to be placed to the left and right side of the pelvis/legs as well as in between the legs.
- ❖ Blanket rolls can be used for padding
- ❖ Patient secured to backboard by placing Spider-Straps to patient making sure to encompass the padding
- ❖ Can utilize a twisted sheet to enhance compression
- ❖ Use of a KED upside down to support hip/pelvis can be beneficial





### **Knee Immobilization (A-Frame for bent knee)**

- ❖ Establish manual stabilization by holding bone above and below knee
- ❖ CMS checked in both lower extremities at the same time
- ❖ A padded board is placed on one side of the knee
- ❖ Another padded board is placed on the other side of the knee. **NO BOARDS WILL BE PLACED UNDER THE KNEE!!** Person holding manual stabilization will continue to hold stabilization and boards in place until splinting is complete.
- ❖ One cravat will need to be tied underneath the knee pulling the two padded boards together. This cravat is only secured around the boards in order to provide better stabilization.
- ❖ Cravats need to be tied at the two locations where the boards intersect with the extremity. At each intersection, the cravat can be tied in an “X” fashion making sure to encompass the leg. Cravats should be tied snugly, but not so tight that circulation is impaired.
- ❖ Recheck CMS on both extremities once splinting is complete



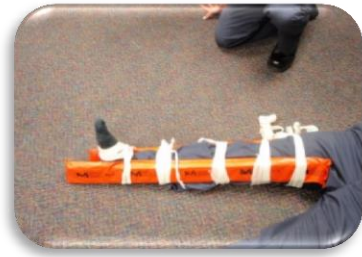
### **Knee Immobilization (straight knee)**

- ❖ Establish manual stabilization by holding bone above and below knee
- ❖ CMS checked in both lower extremities at the same time
- ❖ A padded board is placed on either side of the knee. Person holding manual stabilization will continue to hold stabilization and boards in place until splinting is complete.
- ❖ Alternatively, a padded board could be placed under the leg
- ❖ Two cravats are tied above the knee (lower and upper femur area)
- ❖ Two cravats are tied below the knee (lower and upper tib/fib area)
- ❖ Recheck CMS on both extremities once splinting is complete
- ❖ Immobilization of the ankle is not required



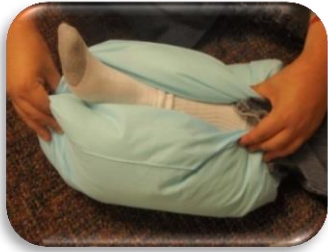
### **Tib/Fib Immobilization (board splints)**

- ❖ Manual stabilization initially done by manually holding the area above and below the PSD (maintained until splinting is complete)
- ❖ CMS checked in both lower extremities at the same time (shoes removed)
- ❖ Padded boards used. A medium padded board is placed on the inside of the leg and a medium padded board is placed on the outside of the leg. The person holding manual stabilization is now also holding the boards against the leg.
- ❖ Two cravats are tied on the upper leg, one on the upper femur area and one above the knee. Two more placed above and below the PSD on the tib/fib.
- ❖ The ankle joint then needs to be immobilized using an additional cravat. It should not allow for any movement of the foot.
- ❖ Recheck CMS on both extremities once splinting is complete



## Ankle Immobilization

- ❖ Manual stabilization done by holding the foot and tib/fib
  - ◇ CMS checked in both lower extremities at the same time
  - ◇ Pillow placed around ankle
  - ◇ Pillow should be positioned around the ankle (to include foot and lower tib/fib), positions will vary depending on size/shape of pillow
  - ◇ Wrap tape or cravats around pillow securing it to ankle
  - ◇ Recheck CMS on both extremities once splinting is complete





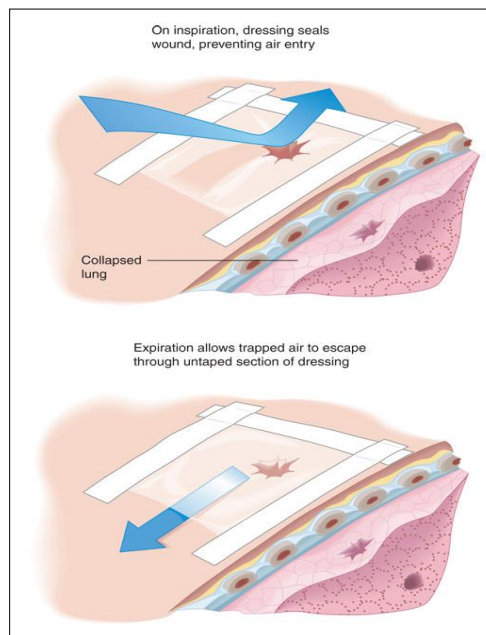
## BLS SKILLS / TREATMENT PROCEDURES



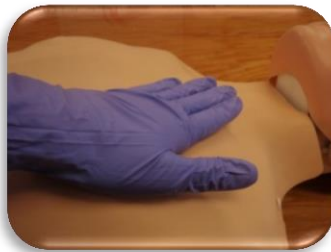
This portion refers to the specific descriptions for various injury treatments. Step-by-step instructions are given along with picture descriptions. Refer to these procedures when instructing the students so that they are taught in a consistent manner.

### Sucking Chest Wound

- ❖ The goal when treating a sucking chest wound is to prevent any additional air from entering the chest cavity, while also allowing any air that is already in the chest cavity to escape .



- ❖ IMMEDIATELY treat when found by covering the open wound with a gloved hand.



- ❖ Then cover with an occlusive dressing taped down along the edges.
  - ◇ An occlusive dressing can be made out of thick plastic wrap or a commercial device can be used (ex. Asherman seal)
  - ◇ Foil or Vaseline dressings CANNOT be used as an occlusive
- ❖ RULE FOR TAPING A SINGLE SUCKING CHEST WOUND
  - ◇ For a single sucking chest wound, the occlusive is preferably taped on three sides (four sides is acceptable IF the provider recognizes that the dressing will need to be “burped”). It is preferred that the side lowest to the ground is left open to allow for any drainage. It does not matter if this sucking chest wound is on the front or back, it gets the same treatment.



- ❖ RULE FOR TAPING MULTIPLE SUCKING CHEST WOUNDS
  - ◇ When dealing with multiple sucking chest wounds, it is important to determine if they are located on the same side of the chest (i.e. right or left of the sternum)
  - ◇ For each chest side, **one** sucking chest wound will get an occlusive taped on three sides. It is preferred that this one will be on the anterior portion of the chest if possible. Each additional sucking chest wound on that same side of the chest will receive an occlusive dressing taped on four sides (so that all edges are sealed and there is no opening).
  - ◇ If there are multiple sucking chest wounds to both sides of the chest, **each side** will receive one occlusive dressing taped on three sides. The remaining wounds will receive an occlusive dressing taped on four sides.
  - ◇ If the provider recognizes what signs and symptoms constitute the need to “burp” a dressing, then all dressings taped on four sides is acceptable.

### Sucking Neck Wound

- ❖ IMMEDIATELY treated when found by placing gloved hand over open wound.
- ❖ Cover with occlusive dressing taped on **four (4)** sides
- ❖ If bleeding is not under control after the occlusive dressing, the following can be done to control bleeding
  - ◇ Apply manual pressure (without applying any pressure to the trachea that might impede air movement in and out of the airway.)
  - ◇ Apply padding on top of occlusive and then loosely wrap around neck/armpit in a figure 8 fashion



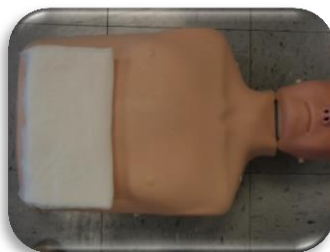
### Flail Chest

- ❖ IMMEDIATELY treated by placing a gloved hand over suspected flail segment when found
- ❖ Immobilize the flail segment by using bulky dressing (trauma padding recommended) and wide tape to minimize paradoxical motion. When applying wide tape, it should be applied from “good ribcage to good ribcage” and cover across the entire bulky dressing.
- ❖ When applying tape and bulky dressing, one person needs to hold bulky dressing in place with a hand. Hand should be placed on the center of the dressing. The partner will start applying the tape. The partner should start with the center of the dressing and cover first where the hand is lying. Once two pieces of taped have been applied in the center and are providing stabilization, the person holding the dressing in place can let go and the other person will finish applying the tape.



### Evisceration

- ❖ NEVER ATTEMPT TO REPLACE OR APPLY PRESSURE ON ABDOMINAL ORGANS!
- ❖ Cover organs with a bulky **moist** sterile dressing, and then cover with an occlusive dressing taped on **four** sides
  - Sterile water/saline and trauma padding recommended
- ❖ **Organs must be kept warm and moist!**



### General Bleeding Control

- ❖ The following steps are used to manage external bleeding. They are listed in the order that they should be completed. If the first step does not control the bleeding, move on to the next step.
- ❖ Direct pressure: Accomplished by applying a sterile gauze pad over the injury site and then applying finger-tip pressure directly to the bleeding site.
- ❖ Tourniquet: Used as a last resort to control external bleeding. If a commercially produced device is available then it can be used. A cravat or cloth can be used as a tourniquet as well. To apply a tourniquet, follow these steps:
  - ❖ Use a cravat 4 inches wide and 6-8 layers deep
  - ❖ Wrap the bandage around the extremity twice at a point proximal to the bleeding but as distal on the extremity as possible
  - ❖ Tie one knot in the bandage, place a stick or rod on top of the knot, and tie the ends of the bandage over the stick in a square knot
  - ❖ Twist the stick until bleeding stops
  - ❖ Once the bleeding has stopped, secure the stick in position
  - ❖ The use of a tourniquet and the time it was applied should be written on a piece of tape and placed in a prominent site on the patient, i.e. alongside the wound or on the patient's forehead. Universally understood terminology for a tourniquet is 'TK'.
  - ❖ Document the use of a tourniquet and the time applied in the pre-hospital patient care report.



### Burns to Hand/Fingers and Foot/Toes

- ❖ In general, burns should be treated by stopping the burning process (with sterile water), apply a dry sterile dressing and treat for shock / hypothermia.

- ❖ Burns to the hand and feet should have all exposed clothing removed, along with any jewelry, due to swelling of tissue.
- ❖ Place gauze between each of the digits (fingers are shown, but toes also)
- ❖ Then the hand or foot needs to be covered with a dry sterile dressing



### **Penetrating Object (Chest or Neck)**

- ❖ For an impaled object, initially stabilize the penetrating object with a hand to prevent movement
- ❖ Apply occlusive dressing around penetrating object while stabilization is still being held
  - ◇ Depending on shape of penetrating object, one option is to cut a hole in the center of the occlusive and place over penetrating object onto skin. Hole should just be big enough to allow penetrating object through. The area around the hole and penetrating object should be sealed with tape to prevent air entry.
  - ◇ Another option is to wrap occlusive dressing around the penetrating object and seal the edges and overlapping area with tape to prevent leakage
- ❖ Apply bulky padding on top of occlusive dressing
  - ◇ Roller gauze should be used for this. Place in a stacking method, 2-3 rows high. Does not need to be placed the entire length of penetrating object.
- ❖ Secure bulky padding with tape, pulled tightly to prevent flopping of object



Penetrating Object (Chest)



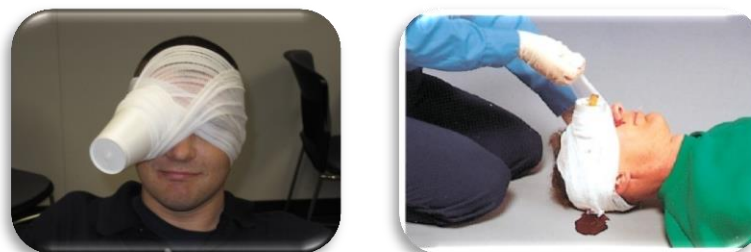
Penetrating Object (Neck)

### Penetrating Object (Eye)

- ❖ Gently stabilize the penetrating object with a hand to prevent any further movement
- ❖ Stabilize the object with cling rolls prior to wrapping the eyes
  - ◇ To keep the bandage from putting pressure on the eye/orbit a “donut” can be made using cling or a cravat wrapped around itself and placed around the eye



- ❖ Securing a cup over the impaled object will help prevent any accidental knocking or further impaling of the object
  - ◇ Both eyes will need to be covered to prevent movement of the injured eye



### Penetrating Object (Abdomen)

- ❖ Stabilize the penetrating object with a hand to prevent further movement
- ❖ Apply bulky padding around penetrating object while maintaining stabilization
  - ◇ One accepted method is to use roller gauze, placed in a stacking method, 2-3 rows high. It does not need to be placed the entire length of the impaled object.

- ❖ Secure bulky padding with tape, pulled tightly to prevent flopping of object

